Espressif Systems

ESPRESSIF

ESP8266EX:

AT INSTRUCTION SET

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AUTHOR	Xu Jingjie
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Espressif Systems

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Version Info

Date	Version	Author	Changes	Comments
2014.6.27	0.1	Xu Jingjie	Draft	
2014.7.11	0.11	Xu Jingjie	Passthrough added	
2014.8.12	0.15	Xu Jingjie	Added Timeout and IP settings for AP Edited descriptions for server/ connection/closing functions Added connection to domain	

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1. Overview

This is the documentation for Espressif AT command instruction set and usage. Instruction set is divided into: Basic AT commands, Wifi function, AT commands, TCP / IP Toolbox AT commands.

Note: Please make sure that correct BIN is already in the chip (ESP8266) before the AT commands listed in this documentation can be used.

2. Instruction Description

Each instruction set contains four types of AT commands.

Test	A T+<x>=?	Query the Set command or internal parameters and its range values.
Query	A T+<x>?	Returns the current value of the parameter.
Set	A T+<x>=<...>	Set the value of user-defined parameters in commands and run.
Execute	A T+<x>	Runs commands with no user-defined parameters.

Note:

1. Not all AT instruction has four commands.
2. [] = default value, not required or may not appear
3. String values require double quotation marks, example AT +CWSAP="ESP756190","21030826",1,4
4. Baud rate = 115200

3. Instruction Listing

Command	Description
Basic	
AT	Test AT startup
AT+RST	Restart module
AT+GMR	View version info
Wi-Fi	
AT+CWMODE	Select Wi-Fi application mode
AT+CWJAP	Join Ap
AT+CWLAP	Lists available AP
AT+CWQAP	Disconnect from AP
AT+CWSAP	Set parameters under AP mode
AT+ CWLIF	Check IP of connected device
TCP/IP	
AT+CIPSTATUS	Get connection status
AT+CIPSTART	Establish TCP connection or register UDP ports
AT+CIPSEND	Send Data
AT+CIPCLOSE	Close TCP or UDP connection
AT+CIFSR	Get local IP address
AT+CIPMUX	Start multiple connections
AT+CIPSERVER	Configure as server
AT+CIPMODE	Set module transfer mode
AT+CIPSTO	Set server timeout
Data Rx	
+IPD	Receive network data

4. Basic AT Instruction Set

Command	Description	Response	Reference
AT	**Test AT startup**	OK	
AT+RST	**Restart module**	OK	
AT+GMR	**View version info**	<number> OK	<number> = 8-digit version no.

5. Wi-Fi functions

Command	Description	Response	Reference
AT+CWMODE	**Select Wi-Fi application mode**		<mode> 1: Station 2:AP 3. Both Set command requires reboot (AT+RST)
Test	AT+CWMODE=?	+CWMODE:(<mode> value list) OK	
Query	AT+CWMODE?	Back to current mode +CWMODE:<mode> OK	
Set	AT+CWMODE=<mode>	OK	
AT+CWJAP	**Join Ap**		<ssid>=string value, AP name <pwd>=string value, max 64 ASCII chars
Query	AT+CWJAP?	Back to selected AP +CWJAP:<ssid> OK	
Set	AT +CWJAP=<ssid>,<pwd>	OK ERROR	
AT+CWLAP	**Lists available AP**		<ecn> 0: Open 1: WEP 2: WPA_PSK 3: WPA2_PSK 4: WPA_WPA2_PSK <ssid>=string value, AP name <rssi>=signal strength
Execute	AT+CWLAP	Back to list of AP +CWLAP:<ecn>,<ssid>,<rssi> OK ERROR	

Command	Description	Response	Reference
AT+CWQAP	**Disconnect from AP**		
Test	AT+CWQAP=?	OK	
Execute	AT+CWQAP	OK	
AT+ CWSAP	**Set parameters under AP mode**		Set command requires reboot
Query	AT+CWSAP?	Back to current AP parameters +CWSAP=<ssid>,<pwd>,<chl>,<ecn>	<ssid>=string value, AP name <pwd>=string value, max 64 ASCII chars <chl>=channel no. <ecn> 0: Open 1: WEP 2: WPA_PSK 3: WPA2_PSK 4: WPA_WPA2_PSK
Set	AT +CWSAP=<ssid>,<pwd>,<chl>,<ecn>	OK ERROR	
AT+ CWLIF	**Check IP of connected device**		
Execute	AT+CWLIF	<ip addr> OK	<ip addr>=IP address of connected device

6. TCP/IP Toolbox

Command	Description	Response	Reference
AT+CIPSTATUS	**Get connection status**		<id>=connected ID no. 0-4 <type>=string value, conection type "TCP" or "UDP" <addr>=string value, IP address <port>= port no. <tetype> 0: Connect as client 1: Connect as server
Execute	AT+CIPSTATUS	Back to current connection mode and status +CIPSTATUS:<id>,<type>,<addr>,<port>,<tetype> OK	

Command	Description	Response	Reference
AT+CIPSTART	**Establish TCP connection or register UDP ports**		<id>=connected ID no. 0-4 <type>=string value, conection type "TCP" or "UDP" <addr>=string value, IP address of remote server <port>= port no. of remote server
Test	AT+CIPSTART=?	1. AT+CIPMUX=0 +CIPSTART:(<type>value list),(<IP address>range),(<port>range) +CIPSTART:(<type>value list),(<domain name>range),(<port>range) OK 2. AT+CIPMUX=1 +CIPSTART:(id),(<type>value list),(<IP address>range),(<port>range) +CIPSTART:(id),(<type>value list),(<domain name>range),(<port>range) OK	

Command	Description	Response	Reference
Set	1. Single Connection (+CIPMUX=0) AT +CIPSTART=<type>,<addr>,<port> 2. Multiple Connections (+CIPMUX=0) AT +CIPSTART=<id>,<type>,<addr>,<port>	Syntax correct and connection successful, returns OK else returns ERROR If connection already exists, returns ALREADY CONNECT	
AT+CIPSEND	**Send Data**		<id>= required ID no. of transmit connection <length>=numeric value, size of transmit packet, maximum 2048 bytes
Test	AT+CIPSTART=?	OK	
Set	1. Single Connection (+CIPMUX=0) AT+CIPSEND=<length> 2. Multiple Connections (+CIPMUX=0) AT +CIPSEND=<id>,<length>	Wrap return ">" after set command. Begins receive of serial data, when data length is met, starts transmission of data. If connection cannot be established or gets disconnected during send, returns ERROR If data is transmitted successfully, returns SEND OK	

Command	Description	Response	Reference
Execute	AT+CIPSEND	Wrap return ">" after execute command. Enters pass-through mode, 20ms interval between each packet, maximum 2048 bytes per packet. When single packet containing "+++" is received, it returns to command mode. Command can only be used in pass-through mode and single connection mode.	
AT+CIPCLOSE	**Close TCP or UDP connection**		<id>= required ID no. of connection to close, when id=5, all connections will be closed. (id=5 has no effect in server mode)
Test	AT+CIPCLOSE=?	OK	
Set	Multiply connection mode AT+CIPCLOSE=<id>	No errors, returns OK If connection <id> is disconnected, returns LINK IS NOT	
Execute	Single connection mode AT+CIPCLOSE	No errors, returns OK If no such connection, returns ERROR Prints UNLINK when there is no connection	

Command	Description	Response	Reference
AT+CIPSR	**Get local IP address**		<IP address>: device's current IP address (Station mode) No effect under AP mode
Test	AT+CIPSR=?	OK	
Execute	AT+CIPSR	+CIFSR:<IP address> OK ERROR	
AT+CIPMUX	**Start multiple connections**		<mode> 0: Single Connection 1: Multiple Connection Mode can only be changed after all connections are disconnected. If server is started, reboot is required.
Query	AT+CIPMUX?	+CIPMUX:<mode> OK	
Set	AT+CIPMUX=<mode>	OK If already connected, returns LINK IS BUILDED	
AT+ CIPSERVER	**Configure as server**		

Command	Description	Response	Reference
Set	AT +CIPSERVER=<mode>[,<port>]	OK Server has to be restarted	<mode> 0: Server mode OFF 1: Server mode ON <port>: port number, default value=333 Server monitor will automatically be created when Server mode ON. When a client is connected to the server, it will take up one connection. Server can only be turned ON when AT +CIPMUX=1
AT+ CIPMODE	**Set module transfer mode**		<mode> 0: No-passthrough 2: Passthrough
Query	AT+CIPMODE?	+CIPMODE:<mode> OK	
Set	AT+CIPMODE=<mode>	OK If already connected, returns LINK IS BUILDED	
AT+CIPSTO	**Set server timeout**		<time>: Server timeout Range 0~28800

Command	Description	Response	Reference
Query	AT+CIPSTO?	+CIPSTO:<time> OK	Units in seconds
Set	AT+CIPSTO=<time>	OK	
+IPD	**Receive network data**		
	1. Single Connection (+CIPMUX=1) +IPD,<len>:<data> 2. Multiple Connection (+CIPMUX=1) +IPD,<id>,<len>,<data>	When the module receives network data, it will send the data through the serial port using +IPD command	<id>: id no. given by connection <len>: length of data <data>: received data Only valid in command mode